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| **Nicholas Vadivelu** | | [nicholasvadivelu.com](https://nicholasvadivelu.com/) [github.com/n2cholas](https://github.com/n2cholas) [nicholas.vadivelu@gmail.com](https://uofwaterloo-my.sharepoint.com/Users/nicv/Downloads/nicholas.vadivelu@gmail.com) |
| Experience | NVIDIA · Performance Software Engineering Intern Aug 2020 – Present   * Optimizing sparse BERT inference performance for **TensorRT** in **C++**, enabling a potential **50% reduction** in inference time, memory usage, and power usage for customers   **Uber ATG** · Research Intern Jan 2020 – Aug 2020   * Improved **object detection by** **90%** (AP) and **motion forecasting by** **22%** (L2) of a self-driving neural net under realistic positional error, significantly improving safety for future riders * Wrote a **first author paper** on the learned positional error correction system (accepted at CoRL)   **Google Brain** · Software Engineering Intern May 2019 – Aug 2019   * Unlocked K-FAC for **over 370,000 users** by implementing and open sourcing automatic support for arbitrary neural network architectures and integrating it into the Keras ecosystem * Enabled simple **multi-node, multi-GPU/TPU training** for users by incorporating **TensorFlow's** Distribution Strategy and efficient distributed operation placement * Designed, created, and open-sourced idiomatic, reproducible training recipes for users while carefully considering hyperparameter ranges, baselines, datasets, and models   **John Hancock Financial** · Data Science Intern May 2018 – Aug 2018   * Achieved a **fraud detection rate of** **63%** through designing an unsupervised ML model * Deployed 25 fraud identifying rules in **SQL** that **correctly** **flagged 100+ out of 20,000+** claims   **Sunnybrook Research Institute** · Software Developer Intern Jul 2017 – Aug 2017   * Improved MRI segmentation accuracy by **up to 80%** and reduced time to contour MRI scans from ~**5 hrs to ~40 mins** by implementing techniques including watershed and clustering | |
| Publications | **Nicholas Vadivelu**, Mengye Ren, James Tu, Jingkang Wang, Raquel Urtasun. Learning to Communicate and Correct Pose Errors. In *Conference on Robotics Learning (CoRL)*, Virtual, 2020.  [Pranav Subramani, **Nicholas Vadivelu**, Gautam Kamath. Enabling Fast Differentially Private SGD via Just-in-Time Compilation and Vectorization. *arXiv preprint arXiv:2010.09063,* 2020.](https://arxiv.org/abs/2010.09063) | |
| Open Source | PyTorch Ignite:Improved performance by **up to 63%** by designing and implementing **async updates for distributed metrics** with tests and documentation | |
| Projects | Thrive Life Simulator:Created a **3D ray-casting game engine** from scratch for a dinosaur world simulation game in **Java** with **object-oriented design** and detailed documentation­  Vim Clone: Recreated the text editor using **object-oriented design** and **C++** best practices, such as implementing the **Model-View-Controller** pattern and extensively using STL functionality | |
| Leadership | Data Science Club Lectures: Designed and presented workshops about neural networks in **TensorFlow**,machine learning in **scikit-learn**,and data cleaning in **pandas** for **300+ students**  WATonomous Design Team: Implemented real-time object detection in **Tensorflow, OpenCV** | |
| Education | **University of Waterloo** · Computer Science & Statistics (B. Math) *2017 – 2022*  Cumulative GPA: 3.94/4.00 - Dean's List | |